Middleberg Riddle & Gianna

Attorneys and Counselors

Richard S. Wilensky
Of Counsel

Suite 1600
2323 Bryan Street
Dallas, Texas 75201
(214) 220-6300
(214) 263-6423 (Metro)
(214) 220-3189 (Telecopier)
(214) 220-6334 (Direct Dial)

October 9, 1995

Via Federal Express

Office of the Secretary
Federal Communications Commission
Washington, D. C. 20554

Dear Sir or Madam:

Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415 and 1.419, enclosed herein is an original and nine (9) copies of the Reply Comments of ComTech Associates, Inc.

If you need any additional information, please feel free to call me at the telephone number referenced above.

Sincerely,

Richard S. Wilensky

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Enclosure

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commissions Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services	)	CC Docket No. 92-297
and	)	
Suite 12 Group Petition for Pioneers Preference	)	PP-22

Reply Comments of ComTech Associates, Incorporated on the Third NPRM and Supplemental Tentative Decision

Richard S. Wilensky
Of Counsel
Middleberg Riddle & Gianna
Suite 1600
2323 Bryan Street
Dallas, Texas 75201

October 10, 1995

SUMMARY

ComTech supports the majority of filings in response to the Third NPRM that acknowledge the necessity of allocating 1,000 MHz per license per BTA to LMDS. Potential LMDS operators require bandwidth parity with other distribution technologies in order to compete with entrenched monopoly telephone and video service providers. As a majority of the filings indicate, this is the case for both current analog schemes and anticipated digital modulation schemes that are available to telephone, cable TV, MMDS, DBS, and LMDS service providers alike. The Commission should license the entire 1,000 MHz to one bidder while permitting frequency disaggregation and geographic partitioning. Additionally, the Commission should ignore pleas from interested parties who would reserve spectrum in the 28 GHz band for unspecified services.

The Commission should note that in order for LMDS systems to be competitively and economically viable, LMDS operators will require the ability to conduct subscriber-to-hub transmissions in the 150 MHz in the 29.1 to 29.25 GHz band. The Commission should reject Motorola's attempt to bind LMDS participants to an agreement that was made when sharing arrangements between LMDS and FSS services were contemplated to affect only a small part of a 2000 MHz contiguous LMDS spectrum allocation. Similarly, the Commission should reject public interest calls for free spectrum to develop expensive, non-commercial, and perhaps unnecessary services, at the expense of the LMDS industry.

The record in this proceeding and the 40 GHz proceeding is well established, and LMDS proponents have overwhelmingly demonstrated, that LMDS, as proposed in this docket, is not currently economically viable in the 40 GHz band. The Commission should reject blatant attempts by certain satellite proponents who have no proposed uses for this band to warehouse spectrum. As an alternative, the Commission should consider awarding public interest groups, whose plans are not subject to the strict cost considerations of the marketplace, or satellite interests who do not propose to pay for their frequency allocations, spectrum in 40 GHz.

ComTech strongly encourages the Commission to reject arguments for lenient build-out requirements for incumbent service providers who plan to use LMDS to offer similar services to those that they currently offer in their existing service areas. There is no evidence that incumbent telephony or video service providers face significant competition or that auctions will prevent them from using their inherent market power to defensively acquire LMDS spectrum and prevent competition. We urge the Commission to consider the intent of PCS-cellular cross-ownership bans and the intent of statutory barriers preventing cable TV-MMDS cross-ownership and how they apply to this proceeding. ComTech strongly believes that existing service providers should be able to acquire LMDS spectrum for any proposed use so long as sufficient build-out requirements exist to level the competitive playing field and prevent spectrum hoarding.

Lastly, ComTech strongly encourages the Commission to adopt its proposed band plan prior to the conclusion of WRC-95. Any delay in the deployment of LMDS will deprive consumers of the most viable technology available today for the delivery of enhanced two-way broadband telecommunication services. Additionally, delays in adopting the band plan will only keep open an already contentious proceeding after an acceptable and fair compromise has finally been achieved.

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FEDERAL COMMUNICATIONS COMMISSION

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Reply Comments of ComTech Associates, Incorporated

on the

Third NPRM and Supplemental Tentative Decision

ComTech Associates Incorporated, ("CTA") hereby submits the following reply comments in response to the Commission's Third Notice of Proposed Rule Making to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services ("Third Notice").

1. LMDS REQUIRES 1,000 MHZ OF SPECTRUM.

A. *Broad Support For Commissionś Proposed Band Plan Allocating 1,000 MHz Per Basic Trading Area (BTA) To LMDS.*

First, in the spirit of compromise, ComTech supports the majority of the comments[1] in this proceeding that propose to adopt the Commissionś proposed band plan which allocates 1,000 MHz of spectrum to LMDS. CellularVision, the only commercially operable LMDS system in the world, and acknowledged industry leader, has consistently maintained that successful market operations are contingent upon 1 GHz of spectrum at 28 GHz[2]. Similarly, Texas Instruments and others have remained equally clear[3]

Second, the Commission should clearly understand from the comments that LMDS requires sufficient spectrum to maintain bandwidth parity with technologies used by entrenched service providers. Currently, both cable TV and telephone companies are upgrading their networks with fiber optics that will be deployed deeply into neighborhoods. LMDS operators require similar 1 GHz capacity in order to compete fairly for the distribution of low-cost, bundled telecommunications services over the "last mile" Digital compression may be applied to all media and the Commission should adopt a band plan that accurately reflects the future impact of the widespread availability of compression technologies to all distribution media. Additionally, the Commission should not arbitrarily force LMDS operators to prematurely deploy digital systems ubiquitously. This is especially the case where the Commission itself has acknowledged that "a number of barriers stand in the way to the transition to digital compression."[4] ComTechś concern is that prematurely forcing LMDS to use digital modulation schemes might create market barriers. While we support the use of digital LMDS and strongly believe that it is the correct solution for many markets today, it may not be appropriate for many smaller markets for some time, if ever. In order for the Commission to ensure the fulfillment of its stated goal of deploying new telecommunications services in smaller and less populated service areas, it should move immediately to grant LMDS sufficient bandwidth to obtain capacity parity with alternative distribution media regardless of modulation choice. The Commission should also note that both proponents of digital and

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[1] See Comments of CellularVision, Texas Instruments, Nortel, Hewlett-Packard, BellSouth, GHz Equipment Company, Bell Atlantic, M3 Illinois Telecommunications Corporation, Teledesic, Boeing, Nynex, and PacTel Wireless Broadband Services in CC Docket 92-297, September 7, 1995.

[2] See CellularVision Comments, CC Docket 92-297, September 7, 1995.

[3] See Texas Instruments ex parte filing dated May 12, 1995, "Further Comments of Texas Instruments, Inc. CC Docket No. 92-297", and Comments Of Titan Information Systems, CC Docket 92-297, September 7, 1995.

[4] Annual Assessment of Status of Competition in the Market for the Delivery of Video Programming, Notice of Inquiry, 10 FCC rcd 7805, paras. 66-68 (1995)

analog LMDS systems remain clear in their needs for 1,000 MHz.

B. *The Commission Should Reject Requests For Spectrum Set-Asides For Unidentified Services.*

Unlike some satellite interests whose projects are "in the early stages of development" and find it "impossible to predict future spectrum requirements precisely"[5], potential LMDS operators and equipment integrators are currently deploying commercial systems internationally and domestically[6]. The Commission should reject satellite requests that would jeopardize the widespread commercialization of LMDS, a technology uniquely capable of providing telephony, data, and video services over a combined infrastructure in much-needed competition with wireline monopolies.

C. *The Commission Should Reject Alternatives To The Commission's Proposed Band Plan.*

ComTech does not believe that alternative band plan proposals from GE Americom, DMC, or others should be contemplated. The defined LMDS, FSS and MSS services proposed by interested parties in the instant proceeding are commercially viable uses of the Ka band and they are the most likely to be deployed in an economic and expeditious manner upon resolution of the Third NPRM that allocates 1 GHz of spectrum to LMDS. That these services are economically viable and have a headstart over the vague and nebulous plans of would-be GSO/FSS or point-to-point service providers is hardly something for the Commission to address. Delaying the immediate implementation of viable services in order to permit some participants to continue non-productive, poorly-focused planning activity is not in the public interest and is not within the Commission's responsibilities.

Additionally, the Commission should reject claims that LMDS share additional spectrum with MSS services pursuant to the technical analyses concluded during the 1994 28 GHz Negotiated Rule Making Committee (NRMC). As many commenting parties have shown, the existing sharing arrangement with Motorola must be modified to permit LMDS subscriber-to-hub transmissions.

Similarly, the Commission should reject alternatives to the Commission's proposed band plan such as those from Hughes that depend upon inaccurate statements concerning the absence of evidence in the record to support the fact that LMDS' development costs are higher for two

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[5] See Comments of PanAmSat Corporation, CC Docket No. 92-297, September 7, 1995.

[6] CellularVision of New York has began commercial operation in 1992. See also Texas Instruments letter notice of ex parte communication, June 6, 1995.

500 MHz blocks[7]. Hughes (p. 24) has taken the position that LMDS should be allocated two noncontiguous 500 MHz blocks in opposition to the Commission's proposal of one 850-MHz and one 150-MHz block for LMDS. Further, it should be noted that while Hughes claims that its outdated band segmentation proposal has the support of Texas Instruments, Motorola, Teledesic, Hewlett Packard and Boeing (p.24), a review of the comments of each of these parties in the Third NPRM reveals that each supports the Commission's proposed plan--not the self-serving Hughes plan.

Hughes' self-serving band segmentation proposal increases the burden on both LMDS and NGSO MSS feeder link operators in that it expands the amount of spectrum that would be co-primary between these services to 500 MHz from the 150 MHz in the Commission's more equitable plan which is the product of rational compromise.

Hughes' assertion that "there is no reason to think that the use of non-contiguous spectrum blocks is any more expensive for LMDS systems than it is for satellite systems" (p. 24) is as obviously self serving as its support of its plan for two 500 MHz blocks for LMDS. Hughes is well-aware of the consensus of LMDS proponents, which is clear in LMDS parties' comments in the instant proceeding, that 1000 MHz of spectrum is required if LMDS is to mount a competitive challenge to the entrenched broadband service providers. Meanwhile, 500 MHz blocks are supportive of the Hughes spectrum-reuse-inefficient Spaceway proposal--which, not surprisingly, is set up to use 500 MHz blocks (Spaceway Application, July 26, 1994, p. 33).

There is no question that noncontiguous LMDS spectrum blocks as proposed by Hughes increase LMDS costs, contrary to Hughes' assertions. In support for its position, which the rest of the satellite and LMDS parties have left behind as evidenced by the broad support for the Commission's plan in comments in the Third NPRM, Hughes sets forth an irrelevant and errant assessment attached as Exhibit 1 to its comments ("Assessment of LMDS RF Equipment Start up Costs due to a Non-contiguous Spectrum Allocation, Stanford Telecom, July 3, 1995"). In its brief Exhibit, Hughes and Stanford Telecom recycle outdated arguments already rejected by the Commission in developing its proposed band segmentation plan. Additionally, Hughes and Stanford Telecom make reference to their filings in a different proceeding which has no bearing on the issue of the use of multiple, noncontiguous bands for LMDS. Hughes and Stanford Telecom proceed to cite a hypothetical European system configuration, that is not in deployment anywhere in the world today and has been demonstrated to be economically impractical in North America. It is enlightening to note that no LMDS proponent in the instant proceeding has proposed to use the paper European design

[7] See Comments of Hughes Communications Galaxy, Inc., CC Docket No. 92-297, September 7, 1995.

because of its inherent flaws.

Hughes and Stanford Telecom erroneously state that "Increasing the bandwidth for the low-cost RF equipment to 1.5 GHz would cause slight if any cost increase." (p. 3, Exhibit 1). Typical of Hughes' claims which are refuted by other facts it sets forth, Hughes proposed band plan (p. 23) shows that LMDS would be required to operate over a frequency range of 2 GHz, not 1.5 GHz. Thus, the assumptions behind the misdirected Stanford Telecom "analysis" are simply wrong. Additionally, it is interesting to note that Stanford Telecom's reference to the "cost increase" is consistent with Hughes' admission (p. 24) that satellite and LMDS would both be "more expensive" if operated on multiple spectrum blocks. This is precisely the reason Hughes and Teledesic have proposed to operate links on a single, contiguous block of spectrum. Hughes' unintended admission reinforces the assertions of ComTech and other LMDS proponents--that the Commission's proposed band plan is preferable. Even satellite proponent Loral recognizes the cost increases which would accompany the operation of links on fragmented spectrum, particularly where repeaters are involved, whether the system in question is LMDS or satellite when it comments that to operate links over multiple bands would "...add complexity and cost to operate within a fragmented radio band." (p. 3) and "In order to use all of the fragmented bandwidth allocation, the...communication equipment...must be designed to receive, condition, and retransmit the radio signal...The added complexity that must be built into the satellite system can be vastly simplified by making the band allocation contiguous." (Loral comments, footnote 1, p. 3).

ComTech envisions a typical use of the 850 MHz of LMDS spectrum from 27.5 - 28.35 GHz for "downstream" delivery of broadband services and a typical use of the 150 MHz of spectrum from 29.1 - 29.25 GHz for "upstream" traffic. This balance is reflective of one possible business model given the expected market demand for hybrid entertainment/telephony/data services in the LMDS

Consequently, any changes to the Commission's proposed band plan that would force ComTech or any other LMDS service provider to operate downstream services over non-contiguous bands (as Hughes proposes) would drive up equipment cost, particularly for the CPE at the subscriber location. Adoption of the Hughes proposal could result in a doubling of subscriber equipment costs given the necessary changes in the antenna, the low-noise amplifier, the local oscillator/downconverter design and the need for handshaking between the set-top box and the downconverter. Given the sensitivity of LMDS service cost to subscriber equipment cost, these design changes and attendant cost increases, if imposed by the adoption of the Hughes band plan, could cripple LMDS as a viable broadband competitor.

With regard to the accommodation of point-to-point service in the Ka-band, the Commission should reject comments[8] supporting a co-primary point-to-point link allocation in the LMDS band based on two considerations: the widespread availability of alternative spectrum for point-to-point service and potential incompatibilities with the proposed LMDS, FSS, and MSS-feeder uses of the Ka-band. Among the alternative spectrum for point-to-point links is the "virgin territory" of the 38 GHz band: "Huge gobs of bandwidth are available in the 38.6 GHz to 39.5 GHz band allocated to fixed point operation--18 times the total amount originally allocated to cellular telephone operators. This is available in 50_MHz channel pairs (100 MHz per license), more than enough to build a dense web..." ("The Building Blocks for a Competitive Future," Network Computing, September 15, 1995, pp. 39 - 40). Potential incompatibilities between point-to-point services and other services proposed by the Commission in the instant proceeding are also a concern. Given that the deadline for filing of these Reply Comments was extended by nearly two weeks at the request of satellite parties who are attempting to resolve sharing issues, the introduction of any additional pairwise interference concerns in the Commission's band plan would be likely to delay resolution of the contentious 28 GHz issues for several more months at a minimum beyond any resolution date now conceivable.

Finally, the Commission should reject GE American Communications' proposal (pp. 17 - 18) that FSS "gateways" should not be required to terminate gateway operations if an LMDS licensee operates in the "gateway's potential interference zone." (p. 17) This suggestion is absolutely inconsistent with the secondary status of FSS in the 27.5 - 28.35 portion of the band where LMDS is primary as proposed by the Commission in its band plan. Given the encumbrance of the 29.1 - 29.25 GHz LMDS spectrum imposed by MSS-feeder link sharing on a co-primary basis, the adoption of GE's outrageous proposal would deprive LMDS of any primary allocation whatsoever. The secondary designation of FSS in the 27.5 - 28.35 GHz band should remain and the conditions of "secondary" designation for FSS should remain as defined in the Commission's proposed band plan (Third NPRM, paragraph 45).

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[8] See Comments of Telephone and Data Systems, Inc., CC Docket No. 92-297, September 7, 1995. See also Comments of Digital Microwave Corporation, CC Docket No. 92-297, September 7, 1995. See also Comments of the Telecommunications Industry Association, CC Docket No. 92-297, September 7, 1995. See also Comments of Alcatel Network Systems, Inc., CC Docket No. 92-297, September 6, 1995.

D. *The Commission's Proposed Band Plan Is In The Public Interest.*

ComTech strongly disagrees with parties who assert that the Commission's proposed band plan is inconsistent with the public interest, that LMDS is an unexplored or undeveloped technology (after all, CellularVision is the only one of the proposed services operating today), and that an allocation of spectrum to LMDS validates supposed international criticism of the Commission's plan (again, while all LMDS technical innovation occurred in the US, the US will not even be one of the first countries to allocate the spectrum). To the contrary, LMDS is proven, economical, and the most revolutionary technology available today in service of competition and consumer choice.

E. *An LMDS License Should Consist Of 1,000 MHz Of Spectrum And Should Be Auctioned By BTA.*

ComTech fully supports the conclusion of the overwhelming majority of comments in response to the Third Notice that 1,000 MHz of LMDS spectrum should be licensed by BTA according to Rand McNally's *1995 Commercial Atlas and Marketing Guide.*

Additionally, ComTech urges the Commission to accept the comments filed by knowledgeable LMDS system integrators who have been dominant participants in this proceeding that frequency allocations of 1 GHz per service provider per BTA are necessary for LMDS as proposed in this docket. As a potential operator of LMDS systems, CTA strongly believes that operators will require full use of the 1 GHz of spectrum. However, in the unlikely event that a few industry participants require less LMDS spectrum, the Commission should permit spectrum disaggregation.

2. LMDS REQUIRES FULL USE OF 29.1- 29.25 GHZ (150 MHZ).

A. *LMDS No Longer Contemplated For Full 2 GHz in 28 GHz Band.*

ComTech supports comments[9] that LMDS/MSS sharing arrangements in 29.1-29.25 are viable only if LMDS can transmit subscriber-to-hub signals. The ability for LMDS CPE transceivers to operate in this band is crucial for the successful deployment of LMDS. Motorola is correct that major LMDS participants agreed to accept the limitations that were imposed on LMDS subscriber-to-node transmissions during the NRMC. However, LMDS participants accepted those restrictions because it applied only to a small portion of the anticipated contiguous 2 GHz of spectrum that would be awarded to LMDS. ComTech supports the efforts made by LMDS equipment integrators, Motorola, and the Commission to accommodate the needs of all proposed services while maintaining that minor modifications to the MSS/LMDS sharing agreement are necessary and possible in order to ensure the economic viability of all proposed services.

B. *Studies Validate LMDS/MSS Interference Mitigation Techniques That Facilitate LMDS Subscriber-To-Node Transmission In 29.1-29.25 GHz.*

ComTech is encouraged by the analyses presented in the comments of Texas Instruments, Hewlett-Packard and Endgate Technologies which demonstrate that subscriber stations in the LMDS operating in the 29.1 - 29.25 GHz band do not cause unacceptable interference into the IRIDIUM MSS feeder uplink receivers. ComTech reiterates that subscriber transmissions must be allowed in the 29.1 - 29.25 GHz band to avoid crippling the LMDS technology and handicapping LMDS service providers with no justifiable basis.

It is instructive to note that, while the LMDS proponents have provided detailed technical justification for their position regarding the operation of subscriber stations in the 29.1 - 29.25 GHz band shared with MSS feeder links, IRIDIUM has chosen to ignore the Commission's request that "(c)ommenters should support their comments with a complete technical analysis" (Third NPRM, paragraph 63). Instead, Motorola and Iridium resort to hyperbole when they comment that the prohibition of subscriber stations in the 29.1 - 29.25 GHz band is "based on sound technical and practical concerns" (Motorola Comments, p. 4) and that "it is difficult to analyze precisely the effects of multiple subscriber links on the satellites." (Motorola Comments, p. 4). In fact, it is not difficult to analyze the effects of subscriber transmitter on the satellites, as the analyses of Texas Instruments, Hewlett-Packard, and Endgate demonstrate. These analyses objectively and quantitatively dismiss any

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[9] Texas Instruments, Nortel, Hewlett-Packard, CellularVision, and Nynex.

"technical and practical concerns" that IRIDIUM might have. Given this, the prohibition on subscriber stations operating in the 29.1 - 29.25 GHz band should be eliminated in the Commission's proposal.

ComTech reiterates its position that since LMDS licensees will pay for the use of the 150 MHz of spectrum which they share with MSS feeder link stations (which will not pay for the use of the spectrum), we believe that MSS feeder link stations should be required to operate at a minimum elevation angle of 12 to 15 degrees. This will facilitate the operation of LMDS subscriber transmitters in the band shared with MSS feeder links with no adverse impact on the MSS feeder links. Analyses conducted during the Negotiated Rulemaking Period in 1994 demonstrated that above elevation angles of 12 degrees, the operations of MSS feeder links were effectively immune to any interference from the terrestrial LMDS due to geometry.

We note that Motorola has argued against the Commission's suggestion that feeder link earth stations be operated at higher minimum elevation angles than the five degree value that Motorola has proposed. (Motorola Comments, Appendix 1). In their appendix, Motorola shows footprint diagrams for the space vehicle antenna for elevation angles of 5, 8 and 10 degrees, claiming that the change in elevation angle is offset by the change in the footprint size. What Motorola does not disclose is that at an elevation angle of 12 degrees, the size of the footprint decreases significantly from that associated with the footprint at 10 degrees, and furthermore the elevation angle itself, 12 degrees, all but eliminates the impact of any interference from hub or subscriber transmissions.

Moreover, given the flexibility afforded the MSS operators, who can operate eight or more feeder link earth station complexes in the continental U.S., restriction of MSS feeder link operations to elevation angles above 12 degrees should have minimal impact on the feeder link planning for the MSS notwithstanding Motorola's claims in its technical appendix to its Comments. Motorola claims that a 5-degree elevation angle "is necessary to maintain communications with the space segment" (Motorola Comments, Appendix 1, p. 1). To the contrary, an analysis of Motorola's Figure 1 (Motorola Comments, Appendix 1, p.2) reveals that a minimum elevation angle of 12 degrees is operationally feasible: the figure shows a probability of 0.1 that no satellite is visible at a given earth station site for a latitude of 40 degrees, which is typical for the continental U.S. If one considers diversity operation of only four of the minimum eight sites Motorola is allowed by the Commission's proposed rules, the probability of not being able to communicate with the space segment is 0.0001. Thus, the availability of communications to the space segment is 99.99 percent--which exceeds the rain-induced availability of the IRIDIUM feeder links. Motorola would likely argue that diversity operation is not possible--to do so would contradict its self-disclosed plans to operate feeder earth station sites with up to three earth station complexes and 12 earth stations separated by

up to 150 nautical miles at every feeder link site. If diversity operation can be accommodated over 150 nautical miles, it can just as easily be conducted over larger distances.

Beyond these realities, ComTech must reiterate that the interference-to-noise ratio established by MSS proponents as a basis for interference analyses between LMDS and MSS feeder links during the Negotiated Rulemaking proceeding was unnecessarily conservative and should be relaxed. The interference-to-noise ratio which underpins the rules proposed in Appendix B of the Third NPRM was -13 dB. If the interference-to-noise ratio criterion is relaxed to -6 dB, the corresponding change in the receiver operating point (the true measure of system performance) is less than one dB. This change (0.97 dB) can be compared to the excess margin on the MSS feeder link of 4.3 dB. Thus, allowing a 7 dB shift (from -13 dB to -6 dB) of interference-to-noise ratio "absorbs" less than one dB of a 4.3 dB margin, even at an operating angle of 10 degrees. At a minimum operating angle of 12 degrees, as we propose, the impact on the MSS feeder is even less significant.

Consequently, we believe that the values in the proposed new Section 21.1020 (Appendix B, Third NPRM, Proposed Rule Amendments to 47 C.F.R. Part 21) should be established as follows:

Climate Region 1:	-16 dBWi/MHz-km^2
Climate Region 2:	-18 dBWi/MHz-km^2
Climate Region 3,4,5:	-19 dBWi/MHz-km^2

These values represent a 7 dB shift from those proposed in the Third NPRM and utilize less than one dB of the 4.3 dB margin in the link budget for the MSS feeder links. Any imposition of a more restrictive limit in "spectral area density" will create a conflict between build-out requirements and MSS sharing criteria.

C. *Grant Of Vital LMDS Spectrum To Non-Commercial Use Would Hinder The Development Of LMDS.*

ComTech acknowledges that one of the unfortunate effects of the Commissionś proposed compromise band plan is the absence of suitable spectrum in the 28 GHz band for non-commercial interests. Previously, many LMDS proponents, including ComTech, had argued that non-commercial interests should be granted use of 1 GHz of spectrum. These ideas were advanced when the Commission was contemplating the allocation of 2 GHz of spectrum in the 28 GHz band to LMDS. Now that the Commission has proposed only 1 GHz for LMDS and the majority of comments have acknowledged, that the minimum spectrum required for successful commercial LMDS operations is 1,000 MHz, the Commission should continue with its plan to allocate 29.1-29.25 GHz as part of one commercial license per BTA.

ComTech firmly believes that allocating the 150 MHz to non-commercial interests would harm commercial LMDS operators to such an extent that it would drive away the cost advantages that might facilitate the development of non-commercial applications in this band. Additionally, the harm caused to commercial operators and subsequent public benefits arising from competition would not be made up by allocating crucial spectrum in the 28 GHz band for limited services that could effectively be duplicated in other bands.

3. LMDS IS NOT CURRENTLY ECONOMICALLY VIABLE AT 40 GHZ.

The records in the 28 and 40 GHz proceedings clearly establish that LMDS is not economically viable at 40 GHz for the services proposed at 28 GHz[10]. ComTech supports subsequent development of the band, but not at the expense of an LMDS allocation at 28 GHz.

Beyond the issue of viability of LMDS at 40 GHz--the record clearly documents that LMDS is not viable in the 40 GHz band--the fundamental motivation of satellite interests such as GE American Communications to suggest that LMDS should be exiled to the economic graveyard above 40 GHz is of questionable validity and, in many cases, contradictory. GE American Communications claims that LMDS should be moved to 40 GHz to "free up" spectrum for FSS use, but alternatively claims that "mutually exclusive GSO/FSS applications are unlikely" (p.22), that "there are 26 potential orbital positions available for satellites operating in the Ka-band" (p. 24), and that "GE Americom believes that the Commission will be able to

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[10] See CellularVision Reply Comments, ET Docket No. 94-124, March 1, 1995; CellularVision Comments, January 30, 1995. See also Texas Instruments Comments, January 27, 1995.

accommodate all qualified applicants" (p. 24) for Ka-band FSS. By GE's own logic, there is no need to consider a move of LMDS to the 40 GHz band. Any claim that such a move is necessary must be borne out of malice.

Further, if, as Hughes claims, "There is No Basis Yet For Concluding That The 'Principal Use' of The 28 GHz Band For FSS Will Be For Subscriber Services" (p.39), then one would conclude that much of the traffic envisioned by FSS Ka-band satellite proponents would not be subscriber-oriented. Indeed, Hughes admits this: "Hughes believes that a significant amount of 28 GHz spectrum will be used for the types of video distribution and intra-corporate services for which the C and Ku band are primarily used today." (p. 40) If this is true, then it would be expected that, as digital compression is increasingly applied in satellite networks that the C and Ku bands will undergo an evolution doubling or quadrupling their capacity, further relieving the need to operate in the Ka-band.

4. REASONABLE BUILD-OUT REQUIREMENTS SHOULD BE INCREASED FOR INCUMBENT SERVICE PROVIDERS.

A. *ComTech Supports The Majority Of Comments In Support Of Broad Industry Participation In LMDS.*

ComTech supports comments[11] stating the desirability of opening LMDS to all industry participants. This will ensure wide scale deployment and market acceptance while driving equipment costs lower. We also believe that the LMDS is capable of such diverse service offerings that could not be efficiently deployed or effectively regulated were the Commission to impose restrictions on LMDS frequency ownership. At a time when the boundaries between telecommunications services are eroding, it would seem out of place for the Commission to restrict certain companies from utilizing specific technologies.

B. *Incumbent Service Providers Possess Significant Market Advantages.*

The above notwithstanding, however, ComTech strongly disagrees with those parties who deny the need for build-out requirements where auctions are used to allocate spectrum. That may be the case for new entrants, small business, and minorities but it is certainly not the case for incumbent monopoly service providers with formidable market power. Because of the inherent market advantages possessed by incumbent service providers, strict build-out requirements must be adopted. ComTech believes the incumbents' advantages are strong enough to encourage warehousing spectrum as a defensive tactic to prevent competition. For example, the National Cable Television Association is wrong when it states that "the threat that cable operator access to LMDS licenses may eliminate a potential video competitor is far outweighed by the potential for cable operators to help to develop LMDS to compete with non-video services."[12] This argument is wrong simply because multiple services, or non-video services, may not be permitted by law or economically feasible in all BTAs or segments of BTAs. The absence of strict build-out requirements might permit certain cable or telephone companies to warehouse spectrum, especially in medium to small sized markets. Cable operators already possess headend equipment, fiber optics, and other necessary infrastructure compatible with the operation of LMDS that they could effectively credit against the cost of frequency. The same can be said of telephone companies who may seek to supplement their existing networks with limited data, telephony, or video offerings.

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[11] Texas Instruments, The National Cable Television Association, and others.

[12] See comments of The National Cable Television Association, Inc., CC Docket No. 92-297, September 7, 1995.

Additionally, as the Commission recently noted, neither cable TV nor telephone companies experience significant competition in their service areas. In CS Docket 94-48,

> **[t]he Commission found that cable television continues to dominate the distribution of multichannel video programming to consumers in most markets... [and that] cable systems continue to have substantial market power in local video distribution markets. Accordingly, the Commission found that alternative technologies have not yet reached the subscribership levels necessary for the Commission to find vigorous rivalry in local markets for multichannel video programming distribution sufficient to ensure cable rates are reasonable... [and that] for most consumers cable television is the only provider of multichannel video programming. Cable systems continue to have substantial market power at the local distribution level.**[13]

While the FCC's report is a year old, conditions in the market place have not changed. In that same docket, the Commission noted the trend toward consolidation in the industry.

The opportunity to harness existing infrastructure to selectively and defensively utilize portions of the LMDS band demands that build-out requirements be imposed on incumbent service providers (MMDS, cable TV, Telco) who win frequency allocations for BTAs that overlap, or are adjacent to, their existing service areas. The inherent market power that can be achieved by these companies is evidenced by the current trend toward horizontal and geographic consolidation in the cable television industry. The Commission noted this trend when it stated in 1994 that "a number of recent proposed mergers would result in increased clustering or regional concentration."[14] Since the Commission released its study in 1994, the trends that it spotted have materialized. In an article entitled "*MSOs Swapping Their Way To ADI Dominance*", Cable TV Investor noted that

> **almost 20% of the 62 million US cable customer base will have changed hands in 12 months, and practically every one of those moves involves beefing up broad metropolitan coverage...Cox has moved up to 26 systems with an average sub base per system of 123,000--a 23% increase in its average system size. For TCI its string of acquisitions and swaps have been just as dramatic...At the rate that clusters are coming together, it looks like cable MSOs will be able to hit the streets with scale economies...**[15]

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[13] FCC News Report No. DC-2653, "First Annual Report To Congress On Cable Competition Adopted", CS Docket No. 94-48, September 19, 1994.

[14] See News Report No. DC-2653, September 19, 1994. "First Annual Report To Congress On Cable Competition Adopted".

[15] "*MSOs Swapping Their Way To ADI Dominance*", Cable TV Investor, September 18, 1995.

Both operators and capital markets perceive that trading systems between MSOs can result in a net gain to both companies because of the savings that can be realized. ComTech believes that is reasonable to assume that incumbent service providers could credit these savings toward spectrum purchases, continue the consolidation trend in the industry, and reduce the number of potential service providers in the provision of multichannel video services. While we do not think the Commission should restrict incumbent monopolies from pursuing logical and economic trends, we do think that these trends could turn into anti-competitive tendencies if they are not countered with effective build-out requirements. Otherwise, Commission policy would clearly be contradictory to Congress' stated intent of ensuring "a diversity of service providers and new entrants into the telecommunications industry."

C. *The FCC Has Acknowledged That Spectrum Auctions Do Not Eliminate The Need For Build-Out Requirements.*

As the Commission has noted in previous proceedings, auctions are no guarantee that spectrum will not be subject to hoarding or warehousing. In fact, in the PCS Memorandum Opinion and Order released March 4, 1994, the Commission said the following: "[W]e believe that narrowband PCS will be a highly competitive service and that licensees will have strong economic and competitive incentives to construct facilities to meet service demands. Nevertheless, we continue to believe that construction benchmarks are desirable."[17] Again on June 13, 1994, the Commission stated

> **[w]e believe that PCS will be a highly competitive service and that licensees will have incentives to construct facilities to meet the service demands in their licensed service areas. Further, we believe that our use of competitive bidding for PCS licensing and the restrictions on the amount of spectrum that a licensee may control in a geographic area will limit the likelihood that spectrum will be warehoused. Nevertheless, we continue to believe that minimum construction requirements are necessary to ensure that PCS service is made available to as many communities as possible and that the spectrum is used effectively. We note that the Reconciliation Act amendments require the Commission to impose performance requirements.**[18]

ComTech strongly believes that in the absence of either limits on the amount of spectrum that can be owned or cross-ownership restrictions, the Commission should act in the public interest and in compliance with Congress' Omnibus Budget and Reconciliation Act of 1993 and adopt strict build-out requirements for incumbent service providers who obtain LMDS frequency for BTAs that overlap, or are adjacent to, their existing service areas. This is especially the case where those incumbent service providers plan to offer similar, or substantially similar, telecommunications services.

D. *The Commission Should Consider The Intent Of Cross-Ownership Bans.*

ComTech does not support the use of cross-ownership bans in this proceeding. However, we also acknowledge that comments filed noting the absence of statutory barriers against telco, cable TV, or MMDS ownership of LMDS frequency may be misleading. We strongly believe that the *intent* of cross-ownership bans should be considered in this proceeding and accomplished through the use of stricter build-out requirements for incumbent service providers who win frequency allocations in BTAs that overlap or, are adjacent to, their

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[17] Memorandum Opinion and Order, Gen Docket No. 90-314, released March 4, 1994.
[18] Memorandum Opinion and Order, Gen Docket No. 90-314, released June 13, 1994.

existing service areas. Historically, the Commission has used cross-ownership bans "to limit the ability of firms having market power from exploiting that position to engage in activity that restricts output, results in uneconomic pricing, or otherwise would deprive consumers of the full benefits of new entry."[19] In reference to cross-ownership bans in this proceeding, the Commission noted that; "[a]although LMDS is not the Multichannel Multipoint Distribution Service, the two services have many similarities, including the method of product distribution. Accordingly, it appears that the *intent* [emphasis added] of Congress to facilitate competition in the video distribution services would include a ban on cable ownership of LMDS licenses if used to distribute video programming."[20] In a footnote, the Commission implied that this same logic ought to be applied to telephone company ownership of LMDS spectrum where telephone companies seek to provide telephone services. ComTech believes that the Commission should enforce the *intent* of cross-ownership ban as described in the 1992 Cable Act through the use of build-out requirements. If incumbent service providers plan to offer services that are similar to the ones they now provide in their existing service area, they should be subject to our proposed build-out requirements.

When complying with the 1993 Omnibus Budget And Reconciliation Act, the Commission used cross-ownership bans to inspire competition and the entrance of new players into the telecommunications field when developing the rules for PCS auctions and service. The Commission prevented existing cellular companies from obtaining 30 MHz PCS spectrum in their existing service areas. After much debate, the Commission concluded "we remain convinced that restrictions on in-market cellular providers are necessary to achieve our goal of maximizing the number of new viable and vigorous competitors."[21] The Commission went on to say that

> **"our goal in crafting these rules should not be to prevent anticompetitive behavior which may or may not materialize, but rather, to promote competition. Bell Atlantic's assertion that we should not restrict cellular participants because we have no basis for assuming that cellular providers will behave anticompetitively in the PCS market, does not address our goal of promoting vigorous new competition. Similarly, McCaw's arguments that existing cellular providers have minimal market penetration do not respond to our desire to provide consumers with as many competitive choices as possible. We conclude that the public interest would be best served by maximizing the number of viable new**

[19] Notice Of Proposed Rulemaking, Order, Tentative Decision And Order On Reconsideration, CC Docket No. 92-297, released January 8, 1993.
[20] Notice Of Proposed Rulemaking, Order, Tentative Decision And Order On Reconsideration, CC Docket No. 92-297, released January 8, 1993.
[21] Memorandum Opinion and Order, GEN Docket No. 90-314, released June 13, 1994.

entrants in a given market."[22]

The Commission should have the same stated goals of inspiring competition in telecommunications markets using LMDS.

ComTech argues that the absence of a statutory ban preventing cable/mmds/telco-LMDS cross-ownership does not eliminate the need for such bans that will help to promote vigorous new competition and provide consumers with as many competitive choices as possible. Additionally, the Commission should note that if cellular/PCS cross-ownership bans were important even in the face of low cellular penetration rates, this must especially be the case where cable TV and telephone monopolies serve over 96% of existing telecommunications customers in local service areas. Again, ComTech believes that the *intent* of cross-ownership bans should be accomplished by applying stricter build-out requirements on incumbent service providers who win spectrum allocations that overlap, or are adjacent to, their existing service areas.

E. *The FCC Should Use Strict Build-Out Requirements To Prevent The Warehousing Of LMDS Spectrum.*

In summary, ComTech believes that the statutory provisions in the 1992 Cable Act preventing cable-MMDS cross-ownership and the cellular-PCS cross-ownership bans offer substantial precedent for the FCC to ensure that spectrum hoarding does not take place even when auctions are used to allocate spectrum. ComTech proposes that incumbent service providers who win LMDS frequency allocations for BTAs that overlap, or are adjacent to, their existing service areas be subject to the following build-out requirements:

- Service made available to 40% of the population of the BTA within three years from the license grant; and
- service should be made available to 70% of the population of the BTA within six years from the license grant.

These buildout requirements should only apply to incumbent service providers who plan to offer services substantially similar to the ones they currently offer. We do not support these build-out requirements simply to hinder large companies. For example, even though Bell Atlantic (BA) is an investor in, and manages, CellularVision's Brighton Beach, New York system, our proposed build-out requirements for incumbent service providers would be unnecessary. BA possesses none of the unfair market advantage over its competitors in this service area in a way that it would if BA were to offer two-way service in Philadelphia, PA.

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[22] Memorandum Opinion and Order, GEN Docket No. 90-314, released June 13, 1994.

Strict build-out requirements are especially necessary given the increasing unlikelihood that small business, women, and minorities will be granted significant bidding preferences in pending auctions. ComTech believes that strict build-out requirements are the only effective mechanism available to the Commission that can simultaneously keep the LMDS industry open to broad participation while preventing unfair spectrum hoarding by incumbent service providers who possess incentives to suppress competition.

5. THE COMMISSION SHOULD ADOPT THE PROPOSED BAND PLAN IN THE THIRD NPRM PRIOR TO THE INITIATION OF WRC-95 AND HOLD LMDS AUCTIONS.

A. *Broad Consensus For The Commission To Adopt The Band Plan In The Third NPRM.*

ComTech does not agree with any comments that seek to delay the quick resolution of this proceeding. The Commission should not permit delays in this proceeding for WRC-95[23], Technical Advisory Committees[24], or any other reason. Although no supporter of LMDS, Teledesic acknowledges the necessity of resolving of this issue prior to WRC-95. ComTech supports Teledesic's conclusion that "there is no need to defer action on the 28 GHz band plan until the conclusion of WRC-95... Certainly, the plans of all parties seeking to operate in the Ka band should not be held up for Loral, Constellation or others who may decide they want to use the band in the future."[25] It would be a shame for the Commission to delay a proceeding, in which a majority of the parties accept the Commissions proposed band plan and where commercially deployable technologies exist today, so that satellite interests who cannot "predict with a reasonable degree of certainty the services that they will provide using these frequencies"[26] can use WRC-95 to delay the successful implementation of necessary telecommunication services domestically and internationally.

B. *No Contingency Plan Is Necessary.*

ComTech strongly urges the Commission not to accept either proposals for contingency band plans prior to WRC-95 or proposals advocating requests for supplemental comments in this proceeding specifically to accommodate WRC-95.[27] These proposals will only weaken the US' bargaining position at WRC-95 and permit satellite interests to further delay the successful deployment of LMDS. Additionally, since virtually all of the LMDS innovation has occurred in the United States, and since the technology has not been widely deployed, WRC-95 representatives are unlikely to have time to adequately evaluate the potential of LMDS. This will increase the likelihood that certain satellite interests will accomplish their objective of eliminating LMDS at 28 GHz. ComTech supports Teledesic's conclusion that "it

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[23] See Comments of GE Americom, Loral/Qualcomm, Hughes, AirTouch Communications, Inc., TRW, Inc., CC Docket No. 92-297, September 7, 1995.
[24] See Comments of Nynex, CC Docket No. 92-297, September 7, 1995.
[25] See Comments of Teledesic Corporation, CC Docket No. 92-297, September 7, 1995.
[26] See Comments of PanAmSat Corporation, CC Docket No. 92-297, September 7, 1995.
[27] See Comments of GE Americom; and also Constellation Communications, CC Docket No. 92-297, September 7, 1995.

is imperative that a 28 GHz band segmentation plan be adopted in advance of WRC-95."[28]

C. *WRC-95 Should Not Be Allowed To Influence Allocations In The 28 GHz band.*

If appropriate leadership is provided by the U.S. delegation to WRC-95, the band plan established in the instant proceeding should be adopted. It is clear that the only substantive proposals for the 28 GHz band which will be considered at WRC have U.S. origins. The interested parties in this proceeding are all either U.S. entities or multi-national consortia with U.S. leadership. Consequently, it is these U.S. entities--the interested parties in this proceeding--who are the stakeholders in the disposition of 28 GHz band issues in WRC-95. Should the U.S. band segmentation plan, as proposed by the Commission in this proceeding, not be adopted in an appropriate action of the ITU, the result would indicate nothing short of an abdication of responsibility on the part of the U.S. delegation to WRC-95. ComTech firmly believes that the Commission's proposed band segmentation plan should be adopted domestically and vigorously advocated in proceedings in WRC-95. Conversely, the outcome of WRC-95 should have no bearing on the adoption of the Commission's proposed band segmentation plan in the U.S.

6. CONCLUSION

Many comments accurately point out that the Commissions proposed band plan represents the best possible compromise for all interested parties and we urge the Commission to capitalize on its success and immediately adopt the proposed band plan in the Third Notice. ComTech respectfully requests that the Commission quickly move to adopt the proposed band plan in the Third Notice.

The use of strict build-out requirements instead of restricting industry participation will level the competitive playing field for new telecommunications companies, install greater diversity of service providers and competition, and accomplish the stated intent of the 1992 Cable TV Act in the absence of real competition.

ComTech requests that the Commission license 1 GHz per license per BTA and permit individual licensees to disaggregate their spectrum according to their individual requirements.

The Commission should not delay the 28 GHz proceeding pending the outcome of WRC-95.

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[28] See Comments of Teledesic Corporation, CC Docket No. 92-297, September 7, 1995.